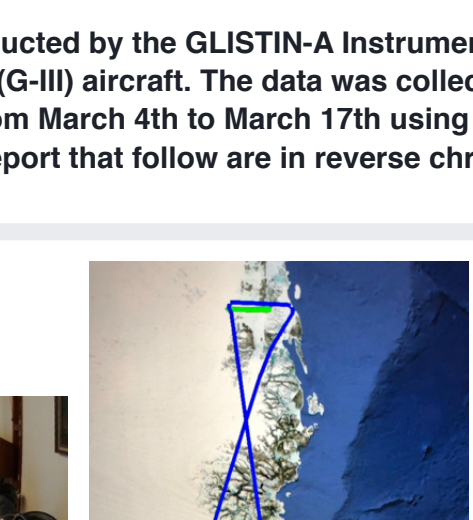
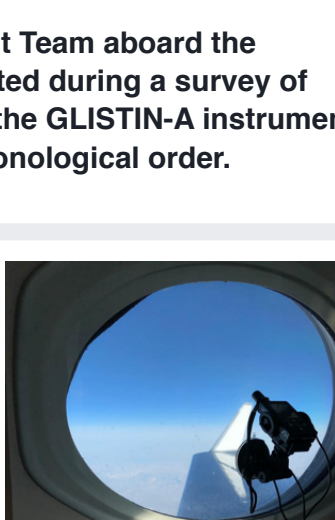
Oceans Melting Greenland (OMG) GLISTIN-A 2019 Campaign Field Report

Global sea level rise will be one of the major environmental challenges of the 21st Century. Oceans Melting Greenland (OMG) will pave the way for improved estimates of sea level rise by addressing the question: To what extent are the oceans melting Greenland's ice from below? Over a five-year campaign, OMG will observe changing water temperatures on the continental shelf surrounding Greenland, and how marine glaciers react to the presence of warm, salty Atlantic Water. The complicated geometry of the sea floor steers currents on the shelf and often determines whether Atlantic Water can reach into the long narrow fjords and interact with the coastal glaciers. Because knowledge of these pathways is a critical component of modeling the interaction between the oceans and ice sheet, OMG will facilitate improved measurements of the shape and depth of the sea floor in key regions as well.

The surveys of Greenland's ice sheet were conducted with the GLacier and Ice Surface Topography INterferometer (GLISTIN-A), which aims to produce high spatial resolution (25 m), high-precision (< 50 cm) height maps of Greenland's coastal glaciers, at 10 to12-km wide swaths using Ka-Band (8.4 mm wavelength) single-pass interferometry. By measuring ice surface elevation changes over several years, volume changes of marine terminating glaciers can be inferred. The GLISTIN-A radar is mounted in a pod under a Gulfstream III airplane. Operating at Ka-Band enhances interferometric accuracy, reduces penetration into the top layers of snow and firn and limits signal attenuation in the atmosphere.

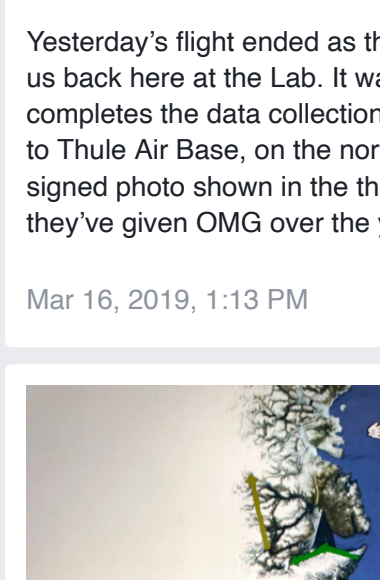
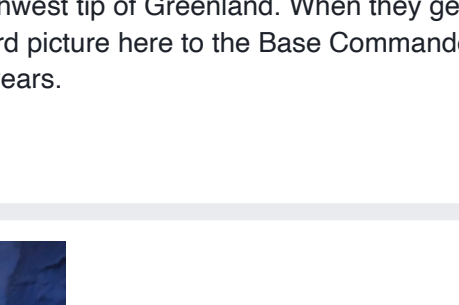
The swaths generally cover the lower parts of the glaciers. The near edges of most swaths are set as close as possible to, and just downstream from, glacier fronts. The remainder of the swaths extend up-glacier from the fronts. Most swaths are flown across glacier flow, capturing as many glacier fronts as possible in each single swath. In the cases of a few large glaciers, swaths are flown along glacier flow, again extending from the front upstream towards the interior of the ice sheet.

This campaign was conducted by the GLISTIN-A Instrument Team aboard the Grumman Gulfstream III (G-III) aircraft. The data was collected during a survey of Greenland's ice sheet from March 4th to March 17th using the GLISTIN-A instrument. The entries of the field report that follow are in reverse chronological order.

Yesterday's flight ended as they all do—with a telecon like this one between the folks in the field and us back here at the Lab. It was a great flight yesterday, picking up 5 lines, which more or less completes the data collection along Greenland's east coast. Monday, the crew will pack up and head to Thule Air Base, on the northwest tip of Greenland. When they get there, they will deliver the signed photo shown in the third picture here to the Base Commander as a thank you for all the help they've given OMG over the years.

Mar 16, 2019, 1:13 PM

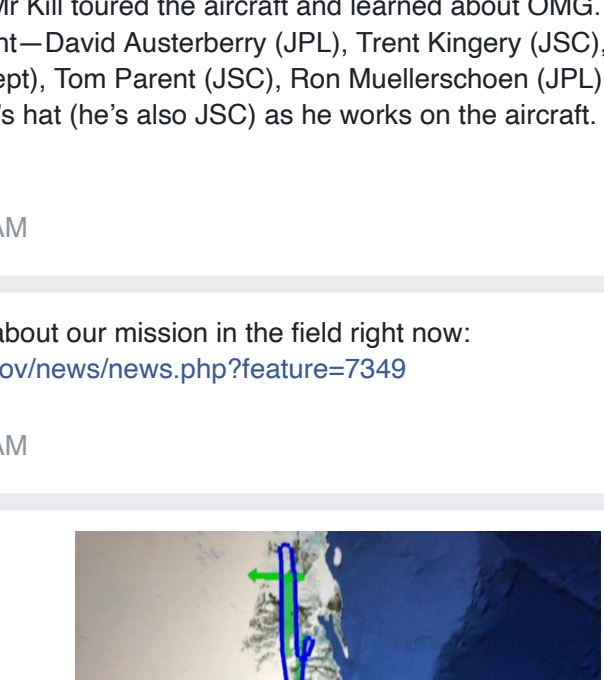



Today the crew completed 11 more lines on the east coast of Greenland. Putting us about halfway through the mission. Yesterday, the crew was honored to host a visit by John Kill, from the US Embassy in Iceland. Mr Kill toured the aircraft and learned about OMG. The photo of the crew shows, from left to right—David Austerberry (JPL), Trent Kingery (JSC), Tyler Thompson (JSC), John Kill (US State Dept), Tom Parent (JSC), Ron Muellerschoen (JPL), and way in the back you can see Johnny Scott's hat (he's also JSC) as he works on the aircraft. Also a photo of a glacier reaching the ocean.

Mar 14, 2019, 10:42 AM

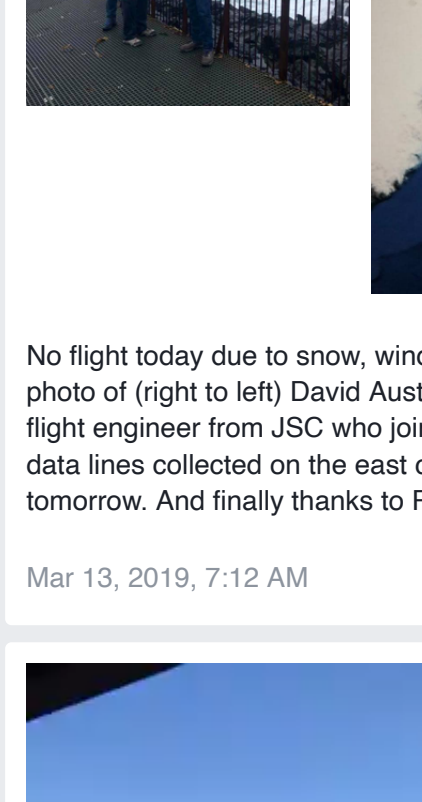
A nice feature article about our mission in the field right now:
https://www.jpl.nasa.gov/news/news.php?feature=7349

Mar 14, 2019, 10:28 AM

No flight today due to snow, wind and then rain. Pretty ugly in Iceland today as you can see in this photo of (right to left) David Austerberry (JPL), mechanic Mike Brown (JSC) and Tyler Thompson, a flight engineer from JSC who joined the crew this week. Yesterday's flight was good, with 8 more data lines collected on the east coast. Weather permitting, the crew will be back in the air again tomorrow. And finally thanks to Ro. For the photos and the stern look there in the horizontal rain.

Mar 13, 2019, 7:12 AM



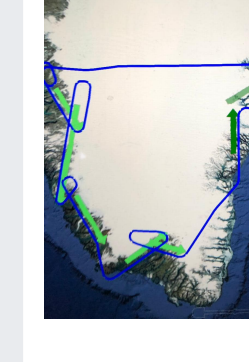
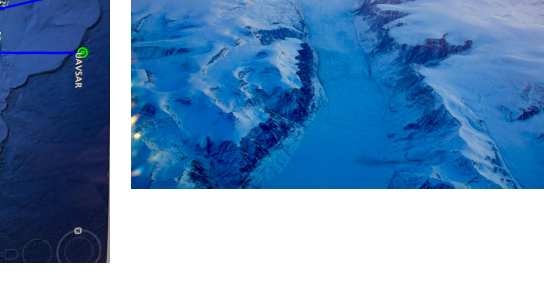
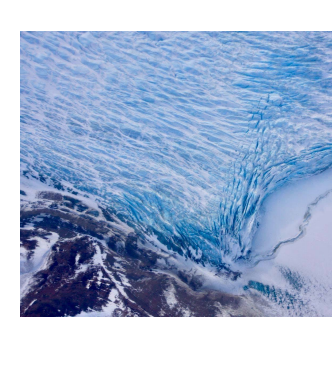
Click for Video

The OMG crew is headed out today to collect more data along Greenland 's easy coast.

Mar 10, 2019, 1:08 AM

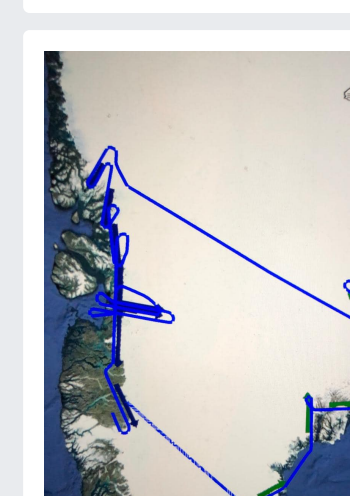
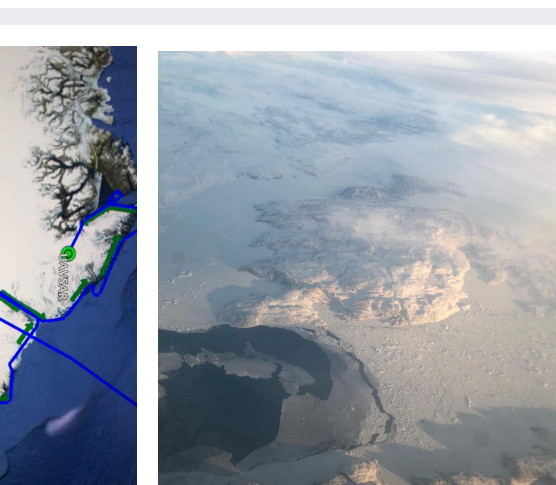
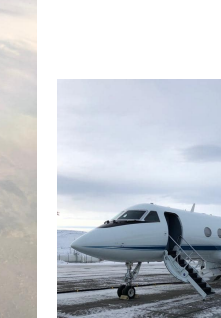
No flights today due to weather, but here's a cool photo from pilot Adam Klein for your viewing pleasure.

Mar 9, 2019, 2:35 PM

Today the OMG crew collected 6 more lines bringing the total for the mission to 34 out of 84. The photo where you can see a slight reflection of flag on someone's sleeve shows a glacier in a long canyon that eventually empties into the ocean. The water there is covered by sea ice making it a bit hard to tell where the glacier ends. The last photo, however shows the obvious end of a glacier which you can tell because of the large cracks in the ice that commonly form near the end of a glacier.

Mar 8, 2019, 11:44 AM

Place: Jakobshavn Glacier (69.1, -49.5)

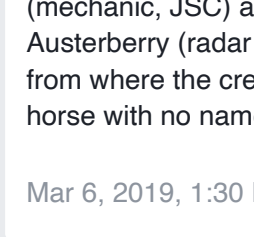
Long day for the OMG crew in Greenland today. We did two flights today with a stop on the west coast airport at Kangerlussuaq to refuel. All told they collected 19 more lines of data over the ice, including maps of the famous Jakobshavn glacier, know in Greenland as Sermeq Kuhalleq. This photo shows open water just beyond (to the left) of the edge of the sea ice edge in the fjord. Photos by Ron M.

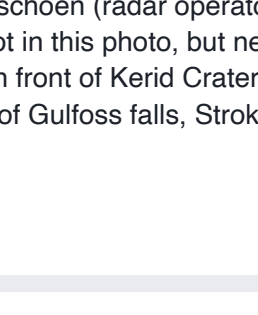
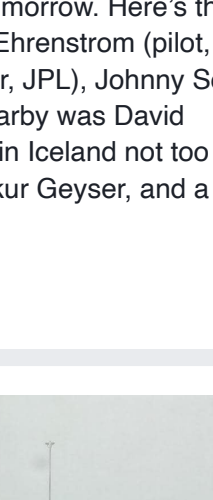
Mar 7, 2019, 1:09 PM

Place: Kangerlussuaq Airport (67.019311799999, -50.693826909614)
Address: Kangerlussuaq Airport (SFJ), 3910 Kangerlussuaq

Big day for the crew in Greenland! Today marks the one hundredth flight of this radar on the NASA 922 aircraft. From left to right, David Austerberry (JPL) Tony Henriquez (JSC), Ron Muellerschoen (JPL), Bill Ehrenstrom (JSC) and Adam Klein (JSC).

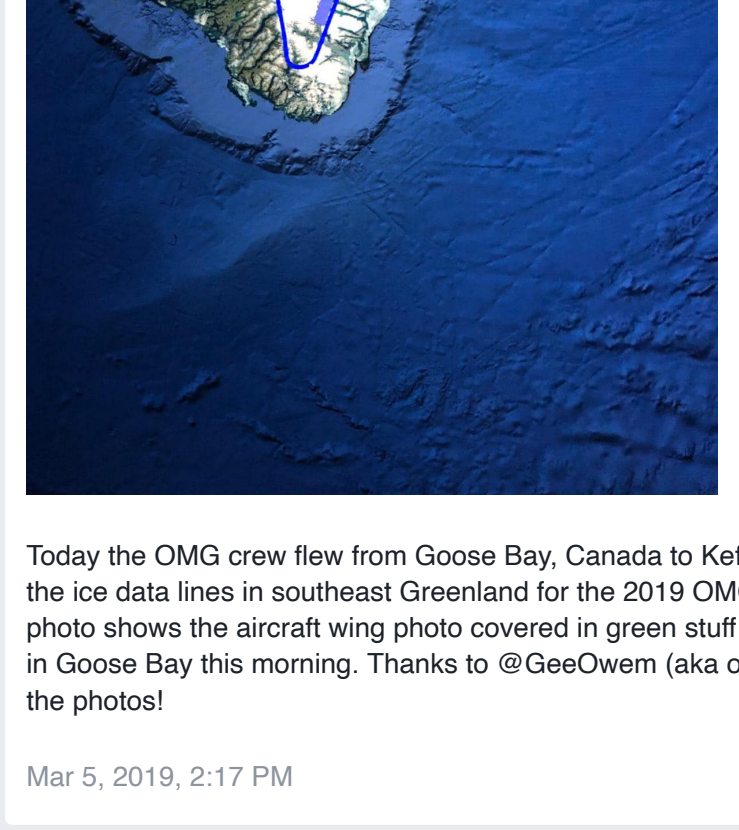
Mar 7, 2019, 11:10 AM



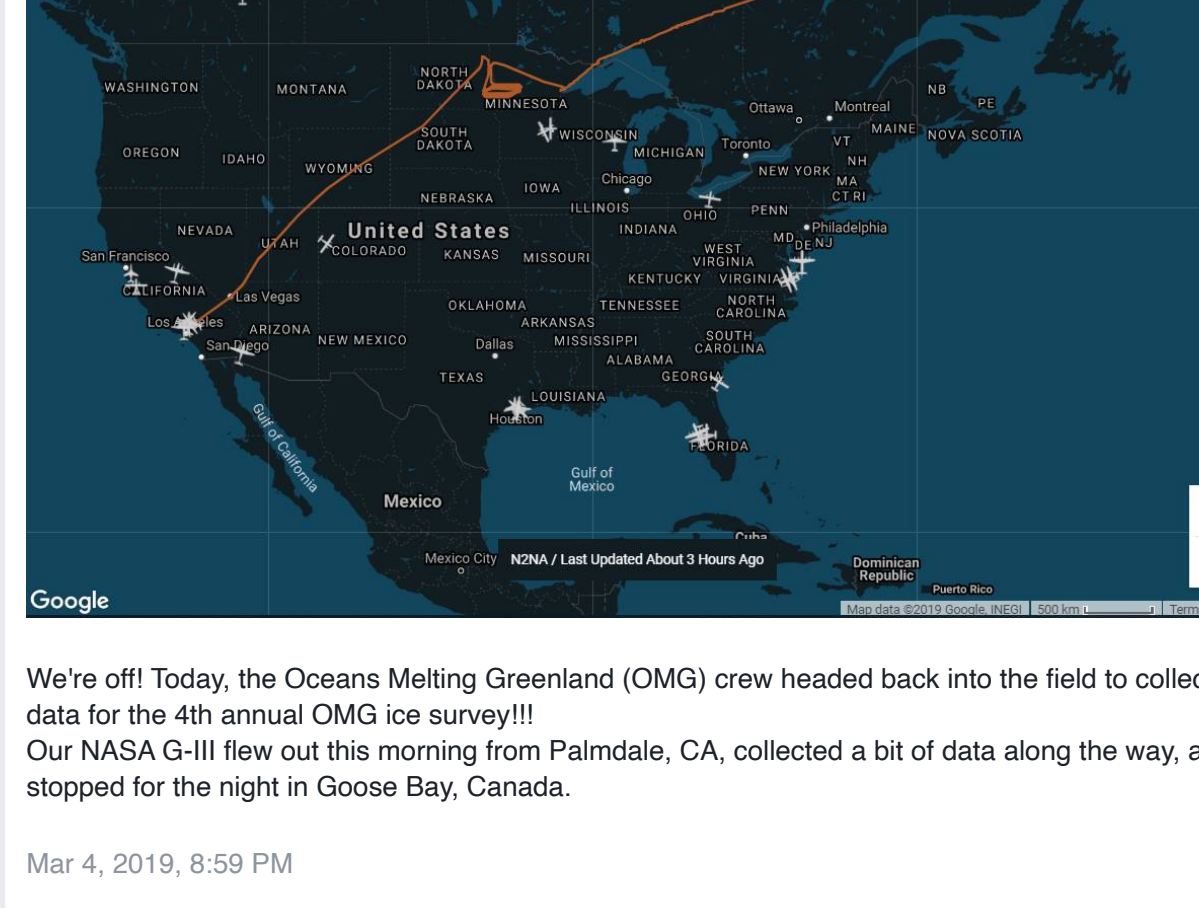
Today the OMG crew had a much needed rest day before a long set of flights tomorrow. Here's the folks in the field with us this year, from left to right: Adam Klein (pilot, JSC), Bill Ehrenstrom (pilot, JSC), Tony Henriquez (flight engineer, JSC), Ron Muellerschoen (radar operator, JPL), Johnny Scott (mechanic, JSC) and Michael Brown (mechanic, JSC). Not in this photo, but nearby was David Austerberry (radar operator, JPL). This photo was taken in front of Kerid Crater in Iceland not too far from where the crew is stationed for this leg. Also photos of Gulfoss falls, Strokkur Geyser, and a horse with no name. Photos complements of Ron M.

Mar 6, 2019, 1:30 PM




Today the OMG crew flew from Goose Bay, Canada to Keflavik, Iceland and collected the first 9 of the ice data lines in southeast Greenland for the 2019 OMG survey. Just 71 more to go! The other photo shows the aircraft wing photo covered in green stuff for de-icing. Apparently it was pretty cold in Goose Bay this morning. Thanks to @GeeOwem (aka our radar operator, Ron Muellerschoen) for the photos!

Mar 5, 2019, 2:17 PM



We're off! Today, the Oceans Melting Greenland (OMG) crew headed back into the field to collect data for the 4th annual OMG ice survey!!!
Our NASA G-III flew out this morning from Palmdale, CA, collected a bit of data along the way, and stopped for the night in Goose Bay, Canada.

Mar 4, 2019, 8:59 PM